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Academy of Sciences be requested to invite the Secretary of the Smithsonian Institution to serve as Chairman of the Government Division; and further that the President of the Academy be requested to present to the President of the United States the personnel of the Government Division to be designated as members of the National Research Council in the Government Division. *(Adopted.)*

The Secretary presented a provisional draft of a bulletin of the National Research Council containing a full description of its organization including the membership of its Divisions and Committees.

Moved: That the draft of the organization of the National Research Council, including the membership of its Divisions and Committees, be printed, subject to the regulations relating to the printing of bulletins adopted at the meeting of the Executive Board on June 10, 1919. *(Adopted.)*

Moved: That Mr. S. L. G. Knox be appointed Assistant to the Scientific Attachés at Paris and Rome, without salary, from April 15 to June 30, 1919, and to Sept. 30, 1919, if Attachés are continued. *(Adopted.)*

Moved: That Mr. Donald J. Cowling, President of Carleton College, be nominated to represent the Association of American Colleges in the Division of Educational Relations in the National Research Council, with recommendation to the President of the National Academy of Sciences that Mr. Cowling be appointed a member of the National Research Council and assigned to the Division of Educational Relations. *(Adopted.)*

The meeting adjourned at 10.45 a.m.

PAUL BROCKETT, *Assistant Secretary.*

REPORT OF THE ANNUAL MEETING OF THE ACADEMY

PREPARED BY THE HOME SECRETARY

The Annual Meeting of the National Academy of Sciences was held at the Smithsonian Institution, Washington, D. C., April 28, 29, and 30, 1919, with President Walcott presiding.

Seventy members were present as follows: C. G. Abbot, Aitken, Ames, Benedict, Birkhoff, Boas, Bumstead, Cannon, Cattell, F. W. Clarke, J. M. Clarke, Conklin, Cross, Cushing, Dall, Davenport, Davis, Day, Dickson, Fewkes, Flexner, Forbes, Hale, E. H. Hall, Hayford, Hillebrand, Holmes, Howard, Howe, Iddings, Jennings, Jewett, Kasner, Langmuir, Leuschner, Loeb, Lusk, Mayor, Mendel, C. H. Merriam, J. C. Merriam, Millikan, Morgan, Moulton, E. L. Nichols, E. F. Nichols, A. A. Noyes, W. A. Noyes, H. F. Osborn, T. B. Osborne, Pearl, Ransome, Reid, Rosa, Russell, Schlesinger, Schuchert, Erwin F. Smith, Stieglitz, Stratton, Thorndike, Ulrich, Van Vleck, Vaughan, Walcott, Webster, Wheeler, D. White, H. S. White, Woodward.

BUSINESS SESSIONS

The Annual Report of the President, containing that of the Treasurer for 1918 in printed form was presented, accepted and distributed to the members.

The following assignments of Biographical Memoirs were announced: Memoirs of Geo. Francis Atkinson to N. L. Britton, of George F. Becker, to A. G. Webster, of Maxime Bôcher to Wm. E. Story, of Edward C. Pickering to H. N. Russell, of Wallace C. Sabine to Edwin H. Hall, and of Charles R. Van Hise to T. C. Chamberlin.

Changes in personnel of sections and committees were announced as follows:

Local Committee: F. L. RANSOME, chairman; M. T. BOGERT, A. O. LEUSCHNER, C. H. MERRIAM, E. F. NICHOLS, E. B. ROSA.

Henry Draper Fund: W. W. CAMPBELL to succeed himself, term expiring in 1924.

J. Lawrence Smith Fund: E. W. MORLEY, to succeed himself, term expiring in 1924. A. O. LEUSCHNER to fill the unexpired term of E. C. Pickering, expiring in 1920.

Comstock Fund: W. R. WHITNEY to succeed A. A. Noyes, term expiring in 1924.

Marsh Fund: J. C. MERRIAM to succeed E. H. Moore as chairman and member, term expiring in 1922.

Murray Fund: W. M. DAVIS, to succeed himself, term expiring in 1922.

Marcellus Hartley Fund: A. A. NOYES, chairman and member, to succeed G. F. Becker, term expiring in 1922. S. W. STRATTON to succeed W. F. Hillebrand, term expiring in 1922.

REPORTS FROM OFFICERS OF THE ACADEMY

The Home Secretary presented the following report, which was accepted.

April 28, 1919.

*The President of the National Academy of Sciences,
Washington, D. C.*

SIR: I have the honor to present the following report of the Acting Home Secretary on the publications and membership of the National Academy of Sciences for the year ending April 30, 1919.

The exigencies of war have retarded printing in Washington and for that reason no scientific memoirs have been published during the year. Publication has been taken up again, however, and four memoirs are now in preparation:

"The Complete Classification of the Triad Systems in Fifteen Elements," by H. S. White, F. N. Cole, and Miss L. D. Cummings, received in manuscript on June 20, 1917 and sent to the Public Printer to be published as Volume XIV, Second Memoir.

"Tables of the Minor Planets—Discoveries by James C. Watson, Part 2: On Von Zeipel's Theory of the Perturbations of the Minor Planets of the Hecuba Group," by A. O. Leuschner, A. E. Glancy, and S. H. Levy, received in manuscript on January 7, 1919, and sent to the Public Printer to be published as Volume XIV, Third Memoir.

"Minor Constituents of Meteorites," by George P. Merrill, received in manuscript on May 11, 1918 and sent to the Public Printer to be published as Volume XIV, Fourth Memoir.

"Tables of the Exponential Function and of the Circular Sine and Cosine to Radian Argument," by C. E. Van Orstrand, received in manuscript May 24, 1918 and sent to the Public Printer to be published as Volume XIV, Fifth Memoir.

No Biographical Memoirs have been published, owing to pressure of war work, but the following biographies have been sent to the printer and are near completion:

Cleveland Abbe, by W. J. Humphreys, received in manuscript November 7, 1917.

Lewis Boss, by Benjamin Boss, received in manuscript March 20, 1917.

William Bullock Clark, by John M. Clarke, received in manuscript January 2, 1918.

James Mason Craft, by Charles R. Cross, manuscript received November 10, 1918.

James Dwight Dana, by L. V. Pirsson, received in manuscript November 12, 1917.

Arnold Hague, by J. P. Iddings, received in manuscript August 2, 1918.

Eugene Woldemar Hilgard, by F. Slate, Jr., received in manuscript October 11, 1918.

Alpheus Spring Packard, by T. D. A. Cockrell, received in manuscript October 16, 1918.

Benjamin Osgood Peirce, by E. H. Hall, received in manuscript November 20, 1917.

With the publication of these memoirs Volume VIII of the Biographical Memoirs will have been published and ready for distribution, while two thousand copies of the Third Annual Report of the National Research Council will be issued in a few days. The PROCEEDINGS of the Academy have been published regularly and have reached the third number of the fifth volume.

Six members have died since the last meeting:

George Francis Atkinson, elected 1918, died November 14, 1918.

George F. Becker, elected 1901, died April 20, 1919.

Maxime Bôcher, elected 1909, died September 12, 1918.

Edward C. Pickering, elected 1873, died February 3, 1919.

Wallace C. Sabine, elected 1917, died January 10, 1919.

Charles R. Van Hise, elected 1902, died November 19, 1918.

One foreign associate, Sir William Crookes, elected in 1913, died April 4, 1919.

There are now on the membership list 164 active members, 1 honorary member, and 35 foreign associates.

C. G. ABBOT, *Acting Home Secretary.*

The Foreign Secretary presented a report on the work of his office during the past year, stating that it largely had to do with the organization of the International Research Council, and that this was fully reported on in the work of the National Research Council.

Moved: That the Report of the Foreign Secretary be accepted, and the action reported therein of the delegates to the International Research Council be approved. (*Adopted.*)

REPORTS FROM COMMITTEES ON TRUST FUNDS

A report was received from the Directors of the Bache Fund, signed by Edwin B. Frost (Chairman) stating that since the annual meeting of the Academy in April, 1918, grants Nos. 210-213 as announced in the PROCEEDINGS, p. 492, below) had been made. (A provisional grant of \$1000 was made for another research, but the applicant had meantime started on his trip of exploration and has not been heard from since, so that it is not certain that the money will be required.) Reports on these and previous grants have been submitted by the recipients, to wit:

The recipient of a grant made some years ago, whose work had not yielded results entirely to his satisfaction, offered to return the money which he had expended, with interest. The directors, however, unanimously declined to accept such return, regarding it as establishing a very unwise precedent which would imply that the recipient of a grant might be personally responsible if a research seriously prosecuted did not yield the results hoped for by him.

No. 202. W. C. ALLEE, Lake Forest, Illinois. The survey of the effect of the re-agents on reactions to light of Mayfly Nymphs. Results published, *Biol. Bul.*, 32, 93-97; and *J. Exper. Zool.*, 26, 423-459. Further work in progress on reversals to light; cause and effects of aggregation in certain Arthropods; effect of cyanides on Arthropods.

No. 203. JOSEPH P. IDDIGS, Brinklow, Md. The work continues and will not be finished for some time yet.

No. 205. T. H. GOODSPEED, Berkeley, Cal. Experiments on Nicotiana, Publication of the final results has been delayed by military and civilian service of the collaborators.

No. 207. T. H. GRONWALL. Mathematical investigations. Preliminary results published in these PROCEEDINGS 5, 22-24, January, 1919, under the title, "A Theorem of Power Series with an Application to Conformal Mapping." Three notes embodying further results are in preparation and will soon be sent to the editor of the PROCEEDINGS.

No. 208. A. F. SHULL, Ann Arbor, Mich. Research is concluded on (1) Cell inconstancy in hydatina; and (2) Relative effectiveness of food, oxygen, etc. in causing or preventing male production. Results published (1) *J. Morph.*, 30, No. 2, March 1918; (2) *J. Exper. Zool.*, 26, No. 3, Aug. 1918. Research is still in progress on nuclea volume in relation to life cycle of hydatina; also on phenomena of maturation in relation to life cycle of hydatina; and on rate of metabolism in relation to life cycle of aphids.

No. 209. CECIL K. DRINKER, Boston. In addition to the first paper, reported last year three others will be sent to the *J. Exper. Medicine* during the coming year, based on the study of material which has been accumulated with the aid of this grant.

No. 210. W. J. ATWELL, Buffalo, N. Y. A research on the development of human hypophysis cerebri is in progress. Three models have been completed by the Bron wax-late method, showing hypophysis of 10 mm., 16 mm., 30 mm. human embryos.

No. 211. GEORGE H. SHULL, Princeton, N. J. The studies on heredity in Shepherd's-purse and Evening Primroses are being carried on with a minimum of labor and would have been impossible without the grant.

The American collaborators of the Nomenclator Animalium Generum et Subgenerum have been paid the amounts due for their work.

A report was received from the Committee on the Henry Draper Fund, signed by W. W. Campbell (Chairman) as follows:

The Committee has unanimously recommended to the Council that the Henry Draper Gold Medal be awarded to Professor Charles Fabry of the University of Marseilles, in recognition of his researches in Physics and Astronomy, chiefly by means of interferometers.

There have been no applications received for grants from the Henry Draper Fund in support of research during the past year. This is probably due in large measure to the fact that many investigators have been engaged upon war problems and that investigators remaining at home have not planned for extensions of instrumental means.

The total amount of income available for the encouragement of research was \$2234.94 on April 1, 1919. Of this sum \$382.44 was cash on hand and \$1952.50 was invested in securities.

A report was received from the Trustees of the Watson Fund, signed by A. O. Leuschner (Chairman), G. C. Comstock and W. L. Elkins, stating that

grants Nos. 18-20 (as announced below, p. 492) were recommended and that reports of progress on previous grants were as follows:

No. 15. A grant of \$300 was made in April, 1917, to Professor HERBERT C. WILSON of Carleton College, Northfield, Minn., for the continuation of the photographic determination of the positions of minor planets. During the past year about 60 plates of minor planets have been secured, but measurement of the positions has been interrupted by loss of assistants. The results obtained under previous grants have been published in Publications of the Goodsell Observatory of Carleton College, Numbers 5 and 6, 1917-18 under the title, "Photographic Observations of Asteroids," by H. C. Wilson, C. H. Gingrich, and Julia M. Hawkes (No. 6).

No. 16. A grant of \$500 was made to Professor JOHN A. MILLER, Director of the Sproull Observatory of Swarthmore College, Pennsylvania, for the employment of an assistant in measuring and reducing plates for the determination of parallaxes. This fund is being paid to Miss Carolyn H. Smedley, Research Assistant in the Observatory. In the fall she also aided in studying the corona of the eclipse of 1918. The sum of \$500 is only part of her salary. The observatory has recently put into press fifty new parallaxes. A great number of series are in process of measurement. Between twenty and twenty-five additional parallaxes are ready for publication.

A report was received from the Committee on the J. Lawrence Smith Fund signed by E. W. Morley (Chairman) stating that reports on previous grants were as follows:

No. 4. Professor C. C. TROWBRIDGE, of the Department of Physics, Columbia University, New York, has received grants amounting to \$1400 to aid in the study of luminous trains of meteors. His lamented and untimely death in June last has put an end to this investigation.

An unfinished paper on the spectra of luminous trains has been completed from his notes by a research assistant familiar with the whole investigation, and is now ready for submission to the Academy. Two other papers are to be completed in the same way: one contains a summary of theories hitherto advanced in explanation of meteor trains, and the other discusses certain auroral phenomena and their relation to theories concerning meteor trains.

Two other parts of Professor Trowbridge's research have probably not gone so far that they can be completed without further investigation. One concerns the drift and diffusion of meteor trains as bearing on the phosphorescent gas theory; the other concerns the height of meteor trains and its relation to the height of the atmosphere. A large amount of classified information, arranged for convenient reference, has been collected by Professor Trowbridge, which it is hoped will be utilized by some one who may interest himself in these or cognate matters.

The department of physics in Columbia University has inquired what disposition shall be made of this material, and the committee suggest that it be forwarded to the Secretary of the Academy for preservation till it may become useful. We have also requested the research assistant of Professor Trowbridge to prepare a paper stating the nature and extent of the information contained in this material, which will soon be ready.

No. 9. Professor S. A. MITCHELL, University of Virginia, University, Va., has received grants amounting to \$1500 to aid in securing observations of meteor paths and radiants, and in computing orbits where the observations suffice. During the last year, war-time activities have interrupted this valuable work. It is now resumed, and the unexpended balance of the grant may well be sufficient for a time.

There is now \$850.39 cash in hand, as well as \$2032.50 invested income, making \$2882.89 available for grants.

A report was received from the Directors of the Benjamin Apthorp Gould Fund, signed by F. R. Moulton, E. E. Barnard and R. S. Woodward, stating that on April 1, 1919, the total income balance of the Gould Fund was \$7028.46, of which \$1773.46 was in cash and \$5255 in interest-bearing securities; and that since April 1, 1919, a grant of \$500 had been made to Benjamin Boss for the support of the *Astronomical Journal*.

A report was received from the Directors of the Wolcott Gibbs Fund, signed by C. L. Jackson, Edgar F. Smith, and T. W. Richards stating that the unexpended income of the fund amounted to \$622.76, of which \$500 had been invested temporarily in Liberty Bonds; that no award had been made; and that reports on previous awards were as follows:

No. 8. Professor R. L. DATTA, University College of Sciences, Calcutta, reports that in spite of hindrance from the war he has procured organic chemicals to the value of three-quarters of the grant, and that these have enabled him to carry on work described in two papers now ready for publication in the *Journal of the American Chemical Society*—"Iodination by Means of Nitrogen Iodide and Replacement of Iodine by Nitro Groups," by R. L. Datta and J. Lahire. This paper contains a careful study of the two reactions including the description of seven new compounds. "The Replacement of Sulphuric Groups of Chlorine and the Preparation of Organic Chloro-derivatives," by R. L. Datta and H. K. Miller. This paper contains a careful study of this reaction.

No reports were received from Professor W. B. Harkins, (Nos. 4 and 7), or from Professor G. P. Baxter, (No. 6).

(No report was presented from the Committee on the Marcellus Hartley Fund, owing to the recent death of the Chairman, Dr. George F. Becker.)

A report was received from the Committee on the Marsh Fund, signed by E. H. Moore (Chairman), stating that the condition of the Fund was

Total capital April 1, 1919.....	\$19,500.00
In addition, cash.....	375.47
Two Liberty bonds.....	150.00
Accrued income to be added May 1, 1919, about.....	227.00

By the addition of \$500 from balance and income the capital is to be raised to \$20,000 February 1, 1920. Reports on previous grants are as follows

No. 1. Dr. JOHN M. CLARKE, Albany, New York: "Mutualism, Symbiosis and Dependent Life among Animals of Geologic Time." In view of the difficulty of completing this investigation under war conditions Dr. Clarke was authorized to make use of part of this Grant for clerical work in the preparation for the Academy of the James Hall biography. Dr. Clarke reports—First—the original investigation is progressing favorably. "Study of geological evidences of parasitism and dependence has proceeded as opportunity permitted. Surveys and selections have been made of the material in several of the larger museums. Special collecting has been done, a good degree of careful preparation made of the material and a considerable number of enlarged stereo photographs made." Second—"The Hall Memoir, which has involved the reading and extraction of 10,000 letters and many other records, is now approaching conclusion, having been brought up to the year 1880."

No. 2. M. Ferdinand Canu, Versailles, France, "Early Tertiary Bryozoa of North America." This grant was to further the completion of investigations in progress in coöperation with Dr. R. S. Bassler of the United States National Museum, who reports: "This work is

now in press as Bulletin 106 of the United States National Museum, consisting of 162 quarto plates and a correspondingly large number of text figures and pages of text. With this assistance we have also completed a study on 'Early Tertiary Cyclostomatous Bryozoa,' which when printed, will amount to about 100 pages of text and 30 to 40 plates."

A report was received from the Committee on the Murray Fund, signed by Wm. H. Dall (Chairman), stating that the total amount of income available from this fund according to the Treasurer, is \$916.91; of which \$516.91 was in cash and \$400 in Liberty Bonds; and that the Committee duly reported their recommendation in regard to the award of the medal which was approved by the Council, and would be carried out at the dinner on April 29, 1919.

GENERAL BUSINESS

A report by the Auditing Committee, C. G. Abbot, L. O. Howard, and David White, stating that the regular financial statement of the Treasurer and the special account in support of the Division of Medicine of the National Research Councils had been duly audited and found correct.

The following report of the Editorial Board of the PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES was received:

The Editorial Board reports as follows regarding its activities during the past year: Volume 4 of the PROCEEDINGS has been completed, and the numbers of Volume 5 are being regularly issued each month.

The articles in Volume 4 of the PROCEEDINGS may be summarized as follows: Mathematics, 9; Astronomy, 11; Physics and Engineering, 25; Chemistry, 5; Geology and Paleontology, including Mineralogy and Petrology, 9; Botany, 3; (see also Genetics); Zoology, including General Biology, 12, (see also Genetics); Genetics, 6; Physiology and Pathology, 10; Anthropology and Psychology, 1; a total of 91 articles. The division of these articles between members of the Academy and non-members is 39 and 52 respectively.

The list of institutions which have contributed three or more articles is as follows: Carnegie Institution, 15, divided as follows: Solar Observatory, 7; Nutrition Laboratory, 4; Geophysical Laboratory, 1; Marine Biology, 2; Station for Experimental Evolution, 1; Harvard University, 15; Brown University, 7; University of Illinois, 5; Bermuda Biological Station for Research, 4; University of California, 4; University of Chicago, 4; University of Pennsylvania, 4.

On April 28, 1919 the Editorial Board held its annual meeting, the following members being present: Messrs. Pearl, Wilson, Day, Hale, Clarke, Jennings, Lusk, Mayor, Millikan, A. A. Noyes, W. A. Noyes, Thorndike, and Wheeler. In regard to the general editorial policy of the PROCEEDINGS, it was held to be desirable to make the PROCEEDINGS, in so far as possible, a publication of permanent original, scientific value, in which duplication of publication should be avoided so far as was consistent with the general policy which has prevailed in the PROCEEDINGS throughout its existence of publishing short articles embodying a brief statement of the results of important researches which were eventually to be published in detail elsewhere. It was agreed that the rule of the PROCEEDINGS requiring prior publication should be waived in the case of summaries of an extended series of papers, some (if not all) of which had already appeared elsewhere, provided that the summary was so written as to be of practical use in enforcing the points made in individual papers and in attracting the attention of workers in related fields, thus making the summary in the PROCEEDINGS a real contribution to the subject.

It was agreed in general to adhere to the present policy of the PROCEEDINGS in retard to having the bulk of its contents made up of numerous short articles of first-class quality, falling in general under the 6-page limit. It was thought desirable, however, to continue the policy of accepting longer articles under special circumstances, 12 to 15 pages being regarded as a proper maximum length for such articles. It was agreed that the Managing Editor and the Chairman of the Board should have all reasonable freedom in exercising their judgment on the administration of policy as to length of articles in particular cases.

A special joint committee of the Editorial Board of the PROCEEDINGS on the one hand, and the National Research Council on the other hand, met and considered the general question of the future relations of the National Research Council and the PROCEEDINGS. The special committee was constituted as follows: For the Editorial Board: the Chairman, the Managing Editor, and Dr. Day; for the National Research Council: Doctors Hale, Merriam and Yerkes. The general policy worked out by this joint committee was agreed to by the Editorial Board. It was in effect this, that the PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES should become in a broader sense than had been true in the past, representative of the activities of the National Research Council, as well as of the National Academy. It was understood that the National Research Council should offer to the PROCEEDINGS as official communications of the Research Council of the National Academy such material (intended for publication as bulletins of the Council) as the Council considered to be of permanent scientific value in the PROCEEDINGS. It was felt that in view of the proposed enlargement of the scope of the PROCEEDINGS to represent the activities of the National Research Council that some changes in the typography of the PROCEEDINGS might be desirable and it was agreed that changes looking to the improvement of the PROCEEDINGS in this regard would be inaugurated as soon as agreement on the matter had been reached between the conferees from the two interested bodies.

Although no formal report can be made on the matter at this time, the Editorial Board is in possession of information which leads it to hope that the financial support of the PROCEEDINGS will be more adequately provided for in the near future. In this event, the Editorial Board expects to inaugurate, with the approval of the Council of the Academy, certain changes in details of policy which will be in the direction of more liberal arrangements between the PROCEEDINGS and its contributors, particularly in the matter of providing a certain number of free reprints to authors. The wisdom of such policy has always been clear to the Editorial Board, but the simple fact of lack of available funds in the past has made it impossible for the Board to carry out its wishes in this matter.

Respectfully submitted,
RAYMOND PEARL, *Chairman.*

The following organization of the National Research Council was presented and, upon motion, was adopted as a whole, with power of amendment vested in the Council of the National Academy of Sciences.

Organization of the National Research Council

Preamble

The National Academy of Sciences, under the authority conferred upon it by its charter enacted by Congress, and approved by President Lincoln on March 3, 1863, and pursuant to the request expressed in an Executive Order made by President Wilson on May 11, 1918, hereto appended, adopts the following permanent organization for the National Research Council, to replace the temporary organization under which it has operated heretofore.

Article I.—Purpose

It shall be the purpose of the National Research Council to promote research in the mathematical, physical, and biological sciences, and in the application of these sciences to engineer-

ing, agriculture, medicine, and other useful arts, with the object of increasing knowledge, of strengthening the national defense, and of contributing in other ways to the public welfare, as expressed in the Executive Order of May 11, 1918.

Article II.—Membership

Section 1. The membership of the National Research Council shall be chosen with the view of rendering the Council an effective federation of the principal research agencies in the United States concerned with the fields of science and technology named in Article I.

Section 2. The Council shall consist of

1. Representatives of national scientific and technical societies;
2. Representatives of the Government, as provided in the Executive Order;
3. Representatives of other research organizations and other persons whose aid may advance the objects of the Council.

Article III.—Divisions

Section 1. The Council shall be organized in Divisions of two classes:

- A. Divisions dealing with the more general relations and activities of the Council;
- B. Divisions dealing with related branches of science and technology.

Section 2. The initial constitution of the Divisions of the Council shall be as follows:

A. Divisions of General Relations:

- I. Government Division.
- II. Division of Foreign Relations.
- III. Division of States Relations.
- IV. Division of Educational Relations.
- V. Division of Industrial Relations.
- VI. Research Information Service.

B. Divisions of Science and Technology:

- VII. Division of Physical Sciences.
- VIII. Division of Engineering.
- IX. Division of Chemistry and Chemical Technology.
- X. Division of Geology and Geography.
- XI. Division of Medical Sciences.
- XII. Division of Biology and Agriculture.
- XIII. Division of Anthropology and Psychology.

Section 3. The number of divisions and the grouping of subjects in Article III, section 2, may be modified by the Executive Board of the National Research Council.

Section 4. The Divisions of General Relations shall be organized by the Executive Board of the National Research Council (Article IV, section 2).

Section 5. To secure the effective federation of the principal research agencies in the United States, provided for in Article II, a majority of the members of each of the Divisions of Science and Technology shall consist of representatives of scientific and technical societies, chosen as provided for in Article V, section 2. The other members of the Division shall be nominated by the Executive Committee of the Division, approved by the Executive Board of the National Research Council, and appointed in accordance with Article V, section 4.

Section 6. The Divisions of the Council, with the approval of the Executive Board, may establish sections and committees, any of which may include members chosen outside the membership of the Council.

Article IV.—Administration

Section 1. The affairs of each Division shall be administered by a Chairman, a Vice-Chairman, and an Executive Committee, of which the Chairman and the Vice-Chairman shall be ex-officio members; all of whom shall be elected annually by the Division and confirmed by the Executive Board.

Section 2. The affairs of the National Research Council shall be administered by an Executive Board, of which the officers of the Council, the President and Home Secretary of the National Academy of Sciences, the President of the American Association for the Advancement of Science, the Chairmen and Vice-Chairmen of the Divisions of Science and Technology and the Chairmen of the Divisions of General Relations shall be ex-officio members. The Executive Board may elect additional members, not to exceed ten in number, who, if not already members of the National Research Council, shall be appointed thereto, in accordance with Article V, section 4.

Section 3. The officers of the National Research Council shall consist of a Chairman, one or more Vice-Chairmen, a Secretary, and a Treasurer, who shall also serve as officers of the Executive Board of the Council.

Section 4. The officers of the National Research Council, excepting the Treasurer, shall be elected annually by the Executive Board. The Treasurer of the National Academy of Sciences shall be ex-officio Treasurer of the National Research Council.

Section 5. The duties of the officers of the Council and of the Divisions shall be fixed by the Executive Board.

Article V.—Nominations and Appointments

Section 1. The Government bureaus, civil and military, to be represented in the Government Division, and the scientific and technical societies, to be represented in the Divisions of Science and Technology of the National Research Council, shall be determined by joint action of the Council of the National Academy of Sciences and the Executive Board of the National Research Council.

Section 2. Representatives of scientific and technical societies shall be nominated by the societies, at the request of the Executive Board, and appointed by the President of the National Academy of Sciences to membership in the Council and assigned to one of its Divisions.

Section 3. The representatives of the Government shall be nominated by the President of the National Academy of Sciences after conference with the Secretaries of the Departments concerned, and the names of those nominated shall be presented to the President of the United States for designation by him for service with the National Research Council.

Section 4. Other members of the Council shall be nominated by the Executive Committees of the Divisions, approved by the Executive Board, and appointed by the President of the National Academy of Sciences to membership and assigned to one of the Divisions.

Section 5. Prior to the first annual meeting of the Council following January 1, 1919, all Divisions shall be organized by appointment of their members in accordance with Article II and Article V, sections 1 to 4.

Section 6. As far as practicable one-third of the original representatives of each scientific and technical society and approximately one-third of the other original members of each of the Divisions of Science and Technology shall serve for a term of three years; one-third for a term of two years, and one-third for a term of one year, their respective terms to be determined by lot. Each year thereafter, as the terms of members expire, their successors shall be appointed for a period of three years.

Section 7. The Government representatives shall serve for periods of three years, unless they previously retire from the Government office which they represent, in which case their successors shall be appointed for the unexpired term.

Section 8. As far as practicable a similar rotation shall be observed in the appointment of the members of the Divisions of General Relations.

Article VI.—Meetings

Section 1. The Council shall hold one stated meeting, called the annual meeting, in April of each year, in the city of Washington, on a date to be fixed by the Executive Board. Other meetings of the Council shall be held on call of the Executive Board.

Section 2. The Executive Board and each of the Divisions shall hold an annual meeting, at which officers shall be elected, at the time and place of the annual meeting of the Council, unless otherwise determined by the Executive Board, and such other meetings as may be required for the transaction of business.

Section 3. Joint meetings of the Executive Board of the National Research Council and the Council of the National Academy of Sciences shall be held from time to time, to consider special requests from the Government, the selection of organizations to be represented in the National Research Council, and other matters which, in the judgment of the President of the National Academy, require the attention of both bodies.

Article VII.—Publications and Reports

Section 1. An annual report of the work of the National Research Council shall be presented by the Chairman to the National Academy of Sciences, for submission to Congress in connection with the annual report of the President of the Academy.

Section 2. Other publications of the National Research Council may include papers, bulletins, reports, and memoirs, which may appear in the Proceedings or Memoirs of the National Academy of Sciences, in the publications of other societies, in scientific and technical journals, or in a separate series of the Research Council.

The following communication from Mr. Whitman Cross, resigning the position of Treasurer, which he had held for eight years, was presented and accepted with regret, in view of the valuable services which Mr. Cross had rendered to the Academy.

April 21, 1919.

My dear Dr. Walcott:

I hereby respectfully tender my resignation as Treasurer of the National Academy of Sciences, to take effect on May first, or as soon thereafter as my successor can qualify. It has been a great pleasure to render to the Academy such service as I could as Treasurer during the last eight years. It is now necessary that I should be able to devote myself exclusively to the completion of work which has been in progress for many years in connection with the United States Geological Survey.

With high appreciation of the opportunity for connection with the work of the Academy for so many years, I am, very sincerely yours,

WHITMAN CROSS.

The Home Secretary was requested to transmit the thanks of the Academy to the Signal Corps of the United States Army, the Smithsonian Institution, the Bureau of Standards, and to the Cosmos Club, for the courtesies extended during the meeting.

ELECTION OF OFFICERS AND MEMBERS

C. G. ABBOT was unanimously elected Home Secretary.

F. L. RANSOME was unanimously elected Treasurer.

J. J. CARTY, H. H. DONALDSON, and RAYMOND PEARL were elected members of the Council.

The following persons were elected as new members of the Academy.

JOSEPH BARRELL, Yale University, New Haven, Conn.
 GARY NATHAN CALKINS, Columbia University, New York.
 HEBER DOUST CURTIS, Lick Observatory, California.
 GANO DUNN, 43 Exchange Place, New York.
 LAWRENCE JOSEPH HENDERSON, Harvard University, Cambridge, Mass.
 REID HUNT, Harvard Medical School, Boston, Mass.
 TREAT BALDWIN JOHNSON, Yale University, New Haven, Conn.
 WINTHROP JOHN VANLEUVEN OSTERHOUT, Harvard University, Cambridge, Mass.
 FREDERICK HANLEY SEARES, Mt. Wilson Observatory, Pasadena, Cal.
 WILLIAM ALBERT SETCHELL, University of California, Berkeley, Cal.
 GEORGE OWEN SQUIER, Major General U. S. A., Washington, D. C.
 AUGUSTUS TROWBRIDGE, Princeton University, Princeton, N. J.
 OSWALD VEBLEN, Princeton University, Princeton, N. J.
 ERNEST JULIUS WILCZYNSKI, University of Chicago, Chicago, Ill.
 EDWIN BIDWELL WILSON, Massachusetts Institute of Technology, Cambridge, Mass.

SCIENTIFIC SESSIONS

Two public lectures on the WILLIAM ELLERY HALE Foundation were given on April 28 and 29 by JAMES HENRY BREASTED, of the University of Chicago, on the Origin of Civilization.

Four public scientific sessions were held on April 28 and 29 at which the following papers were presented:

(NOTE: A dagger † indicates that the paper has been or shortly will be printed in these PROCEEDINGS; the numbers following the dagger are page references to this volume.)

ALFRED G. MAYOR: The age of the fringing reef of Tutuila, American Samoa.

CHARLES D. WALCOTT: Seaweeds and sponges of the Middle Cambrian.

ROBERT G. AITKEN: The spectra of the visual binary stars.

GEORGE E. HALE, F. ELLERMAN, S. B. NICHOLSON and A. H. JOY: The magnetic polarity of sun spots.

WALTER S. ADAMS and A. H. JOY: The motions in space of some stars of high radial velocity.† 239-241.

WALTER S. ADAMS and G. STRÖMBERG: The use of the spectroscopic method for determining the parallaxes of the brighter stars.† 228-232.

ADRIAAN VAN MAANEN (introduced by George E. Hale): Evidence of stream-motion afforded by the faint stars in the Orion Nebula.† 225-228.

GRAHAM LUSK and H. V. ATKINSON: The production of fat from protein after giving meat in large quantity to a dog.† 246-248.

WILLIAM S. HALSTED: End-to-end anastomosis of the intestine—experimental study.

ROBERT M. YERKES (introduced by George E. Hale): Psychological examining in the United States Army.

R. S. LULL (By title): Biographical Memoir of SAMUEL WENDELL WILLISTON.

FREDERICK H. SEARES (introduced by George E. Hale): Relation between color and luminosity for stars of the same spectral type.† 232-238.

FREDERICK H. SEARES, A. VAN MAANEN, and F. ELLERMAN (introduced by George E. Hale): Deviations of the sun's general magnetic field from that of a uniformly magnetized sphere.† 242-246.

W. W. CAMPBELL: The solar corona.

HERBERT E. GREGORY (introduced by W. M. Davis): Plans for exploration of the Pacific.

FRANCIS G. BENEDICT, W. R. MILES, and ALICE JOHNSON: The temperature of the human skin.† 218-222.

S. J. MELTZER and M. WOLLSTEIN: The influence of degeneration of a vagus nerve upon the development of pneumonia.†

Demonstration of war research problems at the National Bureau of Standards.

EDWIN H. HALL: The effect of great pressure on the electric conductivity and thermo-electric properties of metals.

EDWIN H. HALL: Comments on the results of Bridgman's experiment.

CHARLES LANE POOR (introduced by J. S. Ames): Line of position computer.

IRVING LANGMUIR: The arrangement of electrons in atoms and molecules.† 252-259.

HENRY F. OSBORN: Palaeomastodon, the ancestor of the long-jawed mastodons only.† 265-266.

HENRY F. OSBORN: Seventeen skeletons of Moropus: probable habits of this animal.† 250-252.

THOMAS B. OSBORNE and ALFRED J. WAKEMAN: The preparation of vitamine-green proteins.

ARTHUR G. WEBSTER: Quantitative results in interior ballistics.† 259-263.

ARTHUR G. WEBSTER: Quantitative results in elastic hysteresis.

EDWIN H. HALL: Thermal conduction in metals, from the standpoint of dual electric conduction.

EDWIN H. HALL: The thermo-electric equation $P = T dV/dT$ once more.

A. O. LEUSCHNER and SOPHIA H. LEVY: Perturbations of minor plants discovered by James C. Watson: (104) Clymene, (106) Dione, (168) Sibylla, (175) Andromache. (By title.)

ARTHUR G. WEBSTER: The most perfect tuning fork.

ARTHUR G. WEBSTER: Angle of repose of wet sand.† 263-265.

ARTHUR G. WEBSTER (By title): On the equation of state of powder gases whose specific heats satisfy the law of Mallard and Le Chatelier.† 286-288.

C. C. TROWBRIDGE: Meteor train spectra.

EDWARD KASNER: Geometry of the wave equation.

C. G. ABBOT: Rotating projectiles from smooth-bore guns (illustrated).† 386-388.

C. G. ABBOT: Means for measuring the speed of projectiles in flight (illustrated).† 388-389.

C. G. ABBOT: Recent simultaneous measurements of the solar constant of radiation at Mount Wilson, California, and Calama, Chile (illustrated).† 383-386.

JOHN C. MERRIAM: Human remains from the Pleistocene of Rancho La Brea (illustrated).

One public session of the ACADEMY with the National Research Council was held on April 30 at which the following papers were presented:

GEORGE E. HALE: The past work and future plans of the National Research Council.

JOHN C. MERRIAM: The Division of General Relations, Section on Relations with Educational Institutions and State Committees.

R. A. MILLIKAN: The Division of Physics, Mathematics, Astronomy and Geophysics.

DAYTON C. MILLER: Pressures and velocities, internal and external, due to the discharge of large guns.

E. W. WASHBURN: The Division of Chemistry and Chemical Technology.

A. A. NOYES: Nitrate investigations.

WHITMAN CROSS: The Division of Geology and Geography.

R. G. HUSSEY: The Division of Medicine and Related Sciences.

R. M. YERKES: Psychology in relation to the war.

C. E. MCCLUNG: The Division of Agriculture, Botany, Forestry, Zoology and Fisheries.

G. H. CLEVINGER: The Division of Engineering.